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RLBZ2 = Running loss emissions of volatile organic compounds in VOC Control Region 2 in milligrams per mile.

RFBZ2 = Refueling emissions of volatile organic compounds in VOC Control Region 2 in grams per mile.

VOCDI2 = Diurnal emissions of volatile organic compounds in VOC Control Region 2 in milligrams per mile, as determined in paragraph (c)(4) of this section.

VOCHS2 = Hot soak emissions of volatile organic compounds in VOC Control Region 2 in milligrams per mile, as determined in paragraph (c)(4) of this section.

VOCRL2 = Running loss emissions of volatile organic compounds in VOC Control Region 2 in milligrams per mile, as determined in paragraph (c)(4) of this section.

VOCRF2 = Refueling emissions of volatile organic compounds in VOC Control Region 2 in milligrams per mile, as determined in paragraph (c)(4) of this section.

(f) *Limits of the model.* (1) The equations described in paragraphs (c), (d), and (e) of this section shall be valid only for fuels with fuel properties that fall in the following ranges for reformulated gasolines and conventional gasolines:

(i) For reformulated gasolines:

Fuel property	Acceptable range
Oxygen	0.0–4.0 weight percent.
Sulfur	0.0–500.0 parts per million by weight.
RVP	6.4–10.0 pounds per square inch.
E200	30.0–70.0 percent evaporated.
E300	70.0–100.0 percent evaporated.
Aromatics	0.0–50.0 volume percent.
Olefins	0.0–25.0 volume percent.
Benzene	0.0–2.0 volume percent.

(ii) For conventional gasoline:

Fuel property	Acceptable range
Oxygen	0.00–4.0 weight percent.
Sulfur	0.0–1000.0 parts per million by weight.
RVP	6.4–11.0 pounds per square inch.
E200	30.0–70.0 evaporated percent.
E300	70.0–100.0 evaporated percent.
Aromatics	0.0–55.0 volume percent.
Olefins	0.0–30.0 volume percent.
Benzene	0.0–4.9 volume percent.

(2) Fuels with one or more properties that do not fall within the ranges described in above shall not be certified or evaluated for their emissions performance using the complex emissions model described in paragraphs (c), (d), and (e) of this section.

[59 FR 7813, Feb. 16, 1994, as amended at 59 FR 36959, July 20, 1994; 62 FR 68206, Dec. 31, 1997; 71 FR 74566, Dec. 15, 2005]

§ 80.46 Measurement of reformulated gasoline fuel parameters.

(a) *Sulfur.* Sulfur content of gasoline and butane must be determined by use of the following methods:

(1) The sulfur content of gasoline must be determined by use of American Society for Testing and Materials (ASTM) standard method D 2622–03, entitled “Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry” or by one of the alternative method specified in paragraph (a)(3) of this section.

(2) Beginning January 1, 2004, the sulfur content of butane must be determined by the use of ASTM standard test method D 6667–01, entitled, “Standard Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence” or by the alternative method specified in paragraph (a)(4) of this section.

(3) Any refiner or importer may use any of the following methods for determining the sulfur content of gasoline; provided the refiner or importer test result is correlated with the method specified in paragraph (a)(1) of this section:

(i) ASTM standard method D 5453–03a, entitled, “Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Motor Oils by Ultraviolet Fluorescence,” or

(ii) ASTM standard method D 6920–03, entitled, “Standard Test Method for Total Sulfur in Naphthas, Distillates, Reformulated Gasolines, Diesels, Biodiesels, and Motor Fuels by Oxidative Combustion and Electrochemical Detection,” or

(iii) ASTM standard method D 3120–03a, entitled, “Standard Test Method for Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry.”

(iv) ASTM standard method D 7039–04, entitled, “Standard Test Method for Sulfur in Gasoline and Diesel Fuel by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry.”

(4) Beginning January 1, 2004, any refiner or importer may determine the sulfur content of butane using any of

the following methods; provided the refiner or importer test result is correlated with the method specified in paragraph (a)(2) of this section:

(i) ASTM standard method D 4468-85 (Reapproved 2000), "Standard Test Method for Total Sulfur in Gaseous Fuels by Hydrogenolysis and Rateometric Colorimetry," or

(ii) ASTM standard method D 3246-96, entitled, "Standard Test Method for Sulfur in Petroleum Gas by Oxidative Microcoulemetry."

(b) *Olefins*. Olefin content shall be determined using ASTM standard method D 1319B03, entitled "Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption."

(c) *Reid vapor pressure (RVP)*. Reid vapor pressure (RVP) shall be determined using ASTM standard method D 5191-01, entitled "Standard Test Method for Vapor Pressure of Petroleum Products (Mini Method)," except that the following correlation equation must be used:

$$\text{RVP psi} = (0.956 * X) - 0.347$$

$$\text{RVP kPa} = (0.956 * X) - 2.39$$

Where:

X = total measured vapor pressure in psi or kPa.

(d) *Distillation*. Distillation parameters shall be determined using ASTM standard method D 86-01, entitled "Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure."

(e) *Benzene*. (1) Benzene content shall be determined using ASTM standard method D-3606-99, entitled "Standard Test Method for Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography"; except that

(2) Instrument parameters shall be adjusted to ensure complete resolution of the benzene, ethanol and methanol peaks because ethanol and methanol may cause interference with ASTM standard method D-3606-99 when present.

(f)(1) Aromatic content shall be determined using ASTM D 5769-98, entitled, "Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics in Finished Gasolines by Gas Chromatography/Mass Spec-

trometry", except that the sample chilling requirements in section 8 of this standard method are optional.

(2) [Reserved]

(3)(i) Any refiner or importer may determine aromatics content using ASTM standard method D 1319-03, entitled "Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption," for purposes of meeting any testing requirement involving aromatics content; provided that

(ii) The refiner or importer test result is correlated with the method specified in paragraph (f)(1) of this section.

(g) *Oxygen and oxygenate content analysis*. (1) Oxygen and oxygenate content shall be determined using ASTM standard method D 5599-00, entitled "Standard Test Method for Determination of Oxygenates in Gasoline by Gas Chromatography and Oxygen Selective Flame Ionization Detection."

(2)(i) When oxygenates present are limited to MTBE, ETBE, TAME, DIPE, tertiary-amyl alcohol and C₁ to C₄ alcohols, any refiner, importer, or oxygenate blender may determine oxygen and oxygen content using ASTM standard method D 4815-03 entitled, "Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C₁ to C₄ Alcohols in Gasoline by Gas Chromatography," for purposes of meeting any testing requirement; provided that

(ii) The refiner or importer test result is correlated with the method specified in paragraph (g)(1) of this section.

(h) *Incorporations by reference*. ASTM standard methods D 3606-99, entitled "Standard Test Method for Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography;" D 1319-03, entitled "Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption;" D 4815-03, entitled "Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C₁ to C₄ Alcohols in Gasoline by Gas Chromatography;" D 2622-03, entitled "Standard Test Method for Sulfur in Petroleum Products by

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Wavelength Dispersive X-Ray Fluorescence Spectrometry;" D 3246-96, entitled "Standard Test Method for Sulfur in Petroleum Gas by Oxidative Microcoulometry;" D 5191-01, entitled, "Standard Test Method for Vapor Pressure of Petroleum Products (Mini Method);" D 5599-00, entitled, "Standard Test Method for Determination of Oxygenates in Gasoline by Gas Chromatography and Oxygen Selective Flame Ionization Detection;" D 5769-98, entitled, "Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics in Finished Gasolines by Gas Chromatography/Mass Spectrometry," and D 86-01, entitled, "Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure;" D 5453-03a, entitled, "Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Oils by Ultraviolet Fluorescence," D 6920-03, entitled, "Standard Test Method for Total Sulfur in Naphthas, Distillates, Reformulated Gasolines, Diesels, Biodiesels, and Motor Fuels by Oxidative Combustion and Electrochemical Detection," D 3120-03a, entitled, "Standard Test Method for Trace Quantities of Sulfur in Light Petroleum Hydrocarbons by Oxidative Microcoulometry," D 7039-04, entitled, "Standard Test Method for Sulfur in Gasoline and Diesel Fuel by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry," D 6667-01, entitled, "Standard Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence," and D 4468-85 (Reapproved 2000), "Standard Test Method for Total Sulfur in Gaseous Fuels by Hydrogenolysis and Rateometric Colorimetry" are incorporated by reference in this section. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959. Copies may be inspected at the Air Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC, or at the Na-

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tional Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

[59 FR 7813, Feb. 16, 1994, as amended at 59 FR 36961, July 20, 1994; 61 FR 58306, Nov. 13, 1996; 63 FR 63793, Nov. 17, 1998; 65 FR 6822, Feb. 10, 2000; 65 FR 53189, Sept. 1, 2000; 66 FR 17263, Mar. 29, 2001; 67 FR 8737, Feb. 26, 2002; 67 FR 40181, June 12, 2002; 68 FR 56781, Oct. 2, 2003; 68 FR 57819, Oct. 7, 2003; 71 FR 16499, Apr. 3, 2006]

§ 80.47 [Reserved]

§ 80.48 Augmentation of the complex emission model by vehicle testing.

(a) The provisions of this section apply only if a fuel claims emission reduction benefits from fuel parameters that are not included in the complex emission model or complex emission model database, or if the values of fuel parameters included in the complex emission model set forth in § 80.45 fall outside the range of values for which the complex emission model is deemed valid.

(b) To augment the complex emission model described at § 80.45, the following requirements apply:

(1) The petitioner must obtain prior approval from the Administrator for the design of the test program before beginning the vehicle testing process. To obtain approval, the petitioner must at minimum provide the following information: the fuel parameter to be evaluated for emission effects; the number and description of vehicles to be used in the test fleet, including model year, model name, vehicle identification number (VIN), mileage, emission performance (exhaust THC emission level), technology type, and manufacturer; a description of the methods used to procure and prepare the vehicles; the properties of the fuels to be used in the testing program (as specified at § 80.49); the pollutants and emission categories intended to be evaluated; the precautions used to ensure that the effects of the parameter in question are independent of the effects of other parameters already included in the model; a description of the quality assurance procedures to be used during